CLAIMS

What is claimed is:

1. A sensing system adapted to measure one or more values corresponding to one or more physical parameters, the system comprising:

a first sensor mounted onto a side of an optical fiber and optically coupled to said fiber, wherein, when interrogated with light coupled into the fiber, the first sensor generates an optical response corresponding to a first value of a first physical parameter to provide a measure of the first value.

2. The system of claim 1, further comprising:

a first optical filter inserted into the fiber, wherein the first filter is adapted to direct light corresponding to the first sensor between the fiber and the first sensor.

3. The system of claim 2, wherein the filter is aligned with the first sensor and oriented at about 45 degrees with respect to the longitudinal axis of the fiber.

4. The system of claim 2, further comprising a second sensor optically coupled to the fiber, wherein the first filter is designed to be substantially transparent to light corresponding to the second sensor.

5. The system of claim 4, wherein the second sensor is mounted at a terminus of the fiber.

6. The system of claim 4, further comprising:

a second optical filter inserted into the fiber, wherein:

the second sensor is mounted onto the side of the fiber at a location downstream from the location of the first sensor; and

the second filter is adapted to direct light corresponding to the second sensor between the fiber and the second sensor.

7. The system of claim 4, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a second value of the first physical parameter to provide a measure of the second value.

8. The system of claim 4, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a value of the second physical parameter different from the first physical parameter to provide a measure of said value.

9. The system of claim 2, wherein the light corresponding to the first sensor is substantially monochromatic light.

10. The system of claim 1, further comprising:

an interrogation device optically coupled to the fiber and adapted to (i) generate the interrogating light and (ii) detect the optical response.

11. The system of claim 1, further comprising:

a catheter having an external tube and an internal tube enclosed by the external tube, wherein:

the internal tube accommodates the fiber;

the first sensor protrudes through the internal and external tubes;

the first physical parameter is pressure; and

the system is adapted to measure blood pressure in a blood vessel.

12. The system of claim 1, wherein the first sensor comprises:

a first layer supported on a substrate, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter;

a second layer supported on and fixed with respect to the substrate, wherein the first and second layers form a sealed chamber physically connected and optically coupled to the fiber, wherein:

when the portion is moved, the reflectivity of the chamber changes.

13. The system of claim 1, wherein the first sensor is one of a plurality of sensors, in which each sensor is optically coupled to the fiber.

14. The system of claim 13, further comprising:

an interrogation device including, for each sensor:

a light source and a receiver, wherein:

each light source is optically coupled to an optical multiplexer adapted to combine light from different light sources and apply the combined light to the fiber; and

each receiver is optically coupled to an optical de-multiplexer adapted to receive from the fiber light reflected from the sensors, decompose the received light into a plurality of components, each component corresponding to a different sensor, and apply each component to the corresponding receiver.

15. The system of claim 1, further comprising a second sensor optically coupled to the fiber, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a second value of the first physical parameter to provide a measure of the second value.

16. The system of claim 1, further comprising a second sensor optically coupled to the fiber, wherein, when interrogated with the light coupled into the fiber, the second sensor generates an optical response corresponding to a value of the second physical parameter different from the first physical parameter to provide a measure of said value.

17. An optical arrangement, comprising:

an optical filter inserted into an optical fiber; and

an optical device mounted onto a side of the fiber and optically coupled to the fiber, wherein the filter is configured to direct light corresponding to the optical device between the fiber and the optical device.

18. The arrangement of claim 17, wherein the filter is aligned with the optical device and oriented at about 45 degrees with respect to the longitudinal axis of the fiber.

19. The arrangement of claim 17, wherein the optical device is a sensor adapted to measure a value corresponding to a physical parameter, the sensor comprising:

a first layer supported on a substrate, the first layer having a portion adapted to move with respect to the substrate under influence of the first physical parameter;

a second layer supported on and fixed with respect to the substrate, wherein the first and second layers form a sealed chamber physically connected and optically coupled to the fiber, wherein:

when the portion is moved, the reflectivity of the chamber changes.

20. A method of coupling an optical device to an optical fiber, comprising:

inserting an optical filter into the fiber; and

mounting the optical device onto a side of the fiber, wherein:

the device is optically coupled to the fiber; and

the filter is configured to direct light corresponding to the device between the fiber and the device.